

**A PRELIMINARY LIST OF THE AMPHIBIA OF PHUKET ISLAND  
AND ADJACENT MAINLAND, PENINSULAR THAILAND**

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**Introduction**

Two major recent works have been published on the amphibian faunas of South East Asia, namely by TAYLOR (1962) for Thailand and by BERRY (1975) for Peninsular Malaysia. TAYLOR (1962) gives comprehensive descriptions of all amphibians previously recorded with details of their known localities in Thailand. Although many of the species are listed by Taylor as being widely distributed throughout Peninsular Thailand, none have apparently been recorded from Phuket or Phangnga provinces where the present investigations were made. It would appear, in fact, that these areas have not previously been collected to any extent.

Phuket Province is an island situated just off the west coast of Peninsular Thailand (8° N., 98° 5' E.) which for the last nine years has been connected to the mainland by a road causeway (approximately 350 metres long). The majority of primary forest on Phuket Island, except for one small central pocket, has been cut and remains sparsely only in small hill-top areas surrounded by secondary hillside growth (which includes many rubber trees). Thus, when I mention primary forest on Phuket, I refer to limited areas of good mature forest still little disturbed save for secondary shrub growth with very limited cultivated clearings. Lowland areas on Phuket are mainly cultivated, predominantly into rubber plantations, rice fields and coconut palms. Phuket Island has a wet monsoon period from May until November and a dry period from December until April. Mean daily temperature is 28° C., and mean annual precipitation 2351 millimetres (for 1951-1970), approximately 90 per cent of the rain falling during the wet season.

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Collections were made from February 1974 until July 1974, that is during three months of a dry season and the first three months of a wet season. Approximately six hours each week at varying times of the day were spent in the field during this period. Subsequently during the last two years (until July 1976) random collections have been made. Amphibians were collected from streams and adjacent areas of uplands in primary and secondary vegetation; from streams, ponds, ditches, irrigation channels etc. in lowland cultivated areas; and from roads and around buildings during and after rains.

In Phangnga Province, the mainland area directly north and adjacent to Phuket Island, collections were made during the same period from fast flowing torrent streams and adjacent areas in uplands and lowlands of rich primary forest; and from streams, ponds and adjacent areas around the base of limestone massifs. It is noteworthy that no extensive surface limestone is found on Phuket Island and the absence of some amphibians, which are found in Phangnga Province, may be due to this (see below).

In total TAYLOR (1962) recorded one species of Urodela (newt and salamander group), ninety four species of Anura (frog and toad group) and five species of Apoda (caecilian group) for Thailand. During the present study seventeen species of Anura were collected from Phuket and Phangnga provinces collectively and one species of Apoda from Phuket only. Of the Anura, six species recorded in Phangnga Province were not found on Phuket and whilst it is not possible to specifically account for this within the scope of the present study, their absence may have been due to such factors as the lack of suitable substrates and habitats on Phuket. Moreover, the narrow deep channel of tidal seawater which separates Phuket from the adjacent mainland may well have presented a barrier to salt-water intolerant amphibians. In this respect this list of species may prove of value to future workers in assessing any change in the amphibian fauna of Phuket due to dispersal by way of the causeway connecting Phuket to the mainland. It should be noted that many of the common lowland species recorded for Phuket are not recorded here for the mainland. This is very probably due to lack of collecting in



cultivated lowland areas rather than the actual known absence of species from Phangnga Province.

A list of all species collected, with brief notes on their localities (given by province followed by specific localities therein), habitats and sympatry, follows. The amphibians listed under 'sympatry' are those species found at the same locality and general habitat as the species under consideration. Classification of the amphibians follows the same order and nomenclature as presented by BERRY (1975), this being the most recent work on the Malay Peninsula amphibian fauna. It should be noted that all species recorded from Phuket and Phangnga provinces lie within the distributional ranges given by TAYLOR (1962) and all have been recorded in Peninsular Malaysia (SMITH 1930, BERRY 1975). Sonograms of the mating calls, and details of seasonal development of frog larvae for many of the species recorded here, namely *Bufo melanostictus* Schneider, *Ooeidozyga laevis* (Günther), *Rana limnocharis* Boie, *R. nigrovittata* (Blyth), *Rhacophorus leucomystax* (Boie), *Kaloula pulchra* Gray, *Microhyla inornata* Boulenger and *M. heymonsi* Vogt were described by HEYER (1971 a—sonograms, 1973—larvae).

Initial identification was performed by the author with the aid of available literature (SMITH 1916, 1930, INGER 1954, TAYLOR 1962, BERRY 1975), and the names designated were subsequently kindly confirmed or corrected by Dr. R.F. Inger, Field Museum of Natural History, Chicago, U.S.A.. It should be pointed out that this study was carried out on a part time basis and in no way represents a definitive work.

## A P O D A

### FAMILY CAECILIDAE

#### *Ichthyophis glutinosus* (Linnaeus)

**Locality :** Phuket Province—Laem Phan Wa, Patong.

**Ecological notes :** Three specimens only found, two beneath rocks in a slow running, shallow (3 to 5 cm) stream on sandy substrate in dense upland secondary growth; and one freshly dead on road (08.00 hours), in

a lowland cultivated area with no stream locally available, during sunny and fine weather.

*Sympatry*: Found with *Rana doriae* in secondary forest.

## A N U R A

### FAMILY BUFONIDAE

#### *Bufo asper* Gravenhorst

*Locality*: Phangnga Province—Lam Pi Waterfall, Suwan Ku.

*Ecological notes*: Extremely large toad found on dead leaves or rocks at edge of fast flowing torrent stream in upland primary forest (about 150 m a.s.l.). The toad was also collected from damp cellars of local lowland houses which bordered a river near to a limestone massif.

*Sympatry*: Found with *Ooeidozyga laevis* and *Rana hosii* in primary forest; and with *O. laevis*, *Microhyla inornata* and *M. heymonsi* in lowland area.

*Remarks*: For a description of the tadpoles see BERRY (1972).

#### *Bufo melanostictus* Schneider

*Locality*: Phuket Province—Laem Phan Wa, Phuket Town, Surin, Thalang (Botanical Park); Phangnga Province—Phangnga Town suburbs, Suwan Ku.

*Ecological notes*: This species was extremely common in a wide variety of habitats including leaf litter along stream edges in lowland primary forest; the landward edge of a *Nipa* mangrove forest; and beneath *Casuarina* trees on a sandy beach crest. This toad was also commonly found in cultivated areas, suburban gardens and around urban buildings.

*Sympatry*: In primary forest found with *Rana chalconota*, *R. doriae*, *R. erythraea* and *R. macrodon*; and around human habitations with *R. limnocharis*, *R. tigrina*, *Rhacophorus leucomystax* and *Kaloula pulchra*.

*Remarks*: It is noteworthy that C.B. FRITH (in prep.) found three common cobras had eaten toads of this species.

#### *Bufo parvus* Boulenger

*Locality*: Phuket Province—Kata.



*Ecological notes* : One specimen only found on dead leaves situated on moist sand at the base of a dead tree trunk near to a stream in upland secondary growth.

*Sympatry* : Found with *Rana erythraea* and *R. macrodon*.

#### FAMILY RANIDAE

##### *Ooeidozyga laevis* (Günther)

*Locality* : Phuket Province—Phuket Town, Thalang (Botanical Park and nearby lowland stream); Phangnga Province—Lam Pi Waterfall, Suwan Ku.

*Ecological notes* : This species was found beneath damp leaf litter, and among grass and weeds along stream edges in lowland cultivated areas of Phuket Province. In Phangnga Province it was found among leaves in shallow (20 cm) pools and in damp grass along stream edges in upland and lowland primary forest, and river edges at base of limestone massif.

*Sympatry* : Found with *Rana erythraea* and *R. macrodon* in Phuket Province; with *Bufo asper* and *R. macrodon* in primary forest and *B. asper*, *Microhyla inornata* and *M. heymonsi* in river edge habitats in Phangnga Province.

*Remarks* : There exist two distinct morphological forms of this frog, with characters varying according to authors, considered to be worthy of separate specific rank (*Ooeidozyga laevis* (Günther) and *O. martensii* Peters) by some authors (PETERS 1867, TAYLOR 1962), and as subspecies (of *Ooeidozyga laevis*) by others (SMITH 1916 a, 1916 b, INGER 1954). As BERRY (1975) does not list *O. martensii*, although this form is known to occur in Peninsular Malaysia (see SMITH 1916 b), I conclude that she considers *martensii* a subspecies of *O. laevis* and thus omits the former name from her book as it does not deal with subspecies. TAYLOR (1962), however, does recognise the two forms as distinct species. He thus lists *O. laevis* and *O. martensii* as occurring in Peninsular Thailand and provides details of distinguishing characters as he sees them. It is noteworthy, therefore, that both forms described by TAYLOR (1962) were found in the same forest at Phangnga Province during this study.

*Rana chalconota* (Schlegel)

**Locality :** Phuket Province—Thalang (Botanical Park).

**Ecological notes :** This species was found on broad-leaved grasses and shrubs at the edge of a fast flowing stream in lowland primary forest.

**Sympatry :** Found with *Bufo melanostictus*, *Rana doriae*, *R. erythraea* and *R. macrodon*.

**Remarks :** It is noteworthy that this species was found to share the same microhabitat as *R. erythraea* as BERRY (1975) describes *R. chalconota* as the upland ecological counterpart of *R. erythraea*.

*Rana doriae* Boulenger

**Locality :** Phuket Province—Patong, Thalang (Botanical Park); Phangnga Province—Elephant Mountain Cave.

**Ecological notes :** On Phuket this species was found predominantly among leaf litter, under stones and on sandy substrates in and near to upland streams in primary and secondary forest. In Phangnga Province it was found among dense leaf litter in a shallow, slow running stream at the base of a limestone massif near to a large cave.

**Sympatry :** On Phuket it was found with *Ichthyophis glutinosus* in secondary forest and with *Bufo melanostictus*, *Rana chalconota*, *R. erythraea* and *R. macrodon* in primary forest; and in Phangnga was found with *R. macrodon* and *R. nigrovittata*.

*Rana erythraea* (Schlegel)

**Locality :** Phuket Province—Kata, Phuket Town, Surin, Thalang (Botanical Park and other nearby stream areas); Phangnga Province—Phangnga Town suburbs.

**Ecological notes :** This species is extremely common among vegetation at edges of streams, ponds, ditches, irrigation channels etc. in upland secondary growth, lowland primary and secondary vegetation, and cultivated areas.



*Sympatry*: Found with *Bufo parvus* and *Rana macrodon* in upland secondary growth; with *B. melanostictus*, *R. chalconota*, *R. doriae* and *R. macrodon* in primary forest; and with *Ooeidozyga laevis* and *R. macrodon* in lowland secondary and cultivated areas.

*Rana hosii* Boulenger

*Locality*: Phangnga Province—Lam Pi Waterfall.

*Ecological notes*: This frog was found on rocky outcrops amid swift stream torrents in upland primary forest (about 150 m a.s.l.), as was also found to be its typical habitat in Peninsular Malaysia (BERRY 1975).

*Sympatry*: Found with *Bufo asper* and *Ooeidozyga laevis*.

*Remarks*: This frog exhibits an interesting adaptation to its noisy torrent-stream environment in that, rather than croaking, it produces a high pitched whistle. High pitched whistling, believed to be produced by this species, was clearly heard above the noise of loud torrents. That this sound was produced by this species was confirmed by the subsequent capture of a number of them, upon which they emitted a trill-like whistling sound. Such a vocal/auditory adaptation to this particular environment is noteworthy in view of similar adaptations found in numerous torrent dwelling bird species (C.B. FRITH—pers. comm.).

*Rana limnocharis* Boie

*Locality*: Phuket Province—Laem Phan Wa.

*Ecological notes*: This is an extremely abundant frog commonly found in drainage channels, ponds, ditches, rice fields, flooded areas etc., and on roads during and after rains in lowland cultivated areas.

*Sympatry*: Found with *Bufo melanostictus*, *Rana tigrina*, *Rhacophorus leucomystax* and *Kaloula pulchra*.

*Rana macrodon* Duméril and Bibron

*Locality*: Phuket Province—Kata, Thalang (Botanical Park and nearby lowland stream); Phangnga Province—Elephant Mountain Cave, Klong Naka Nature Reserve.

*Ecological notes* : This species was found among leaf litter and on coarse/stony substrates at stream edges in upland secondary vegetation, lowland primary forest and cultivated areas. It is noteworthy that in Phangnga this species was also found on rocks, sand and in a clear fast running stream (3-30 cm deep) approximately thirty metres within a large limestone cave in very nearly total darkness.

*Sympatry* : Found with *Bufo parvus* and *Rana erythraea* in secondary growth; with *Bufo melanostictus*, *R. chalconota*, *R. doriae* and *R. erythraea* in primary forest; with *Ooeidozyga laevis* and *R. erythraea* in cultivated areas; and with *R. doriae* and *R. nigrovittata* at the cave locality.

*Remarks* : It should be pointed out that this species is synonymous with what TAYLOR (1962) described as *Rana blythi* Boulenger for Thailand.

*Rana nicobariensis* (Stoliczka)

*Locality* : Phangnga Province—Klong Naka Nature Reserve.

*Ecological notes* : One specimen only found among leaf debris at river edge in lowland wet rain forest.

*Sympatry* : Found with *Rana macrodon*.

*Rana nigrovittata* (Blyth)

*Locality* : Phangnga Province—Elephant Mountain Cave, Phangnga Town suburbs.

*Ecological notes* : This species was found among vegetation and on rocks at edges of an artificial pond; and on rocks, sand and in a clear cold fast running stream (3-30 cm deep) within a large limestone cave very nearly in total darkness.

*Sympatry* : Found with *Rana doriae* and *R. macrodon* at the cave locality.

*Rana tigrina* Daudin

*Locality* : Phuket Province—Laem Phan Wa, Phuket Town.

*Ecological notes* : This frog was found on roads during and after heavy rains, and in a swampy area at the edge of an artificial pond in the centre of Phuket Town.



*Sympatry* : Found with *Bufo melanostictus*, *Rana erythraea*, *R. limnocharis* and *Rhacophorus leucomystax*.

## FAMILY RHACOPHORIDAE

### *Rhacophorus leucomystax* (Boie)

*Locality* : Phuket Province—Laem Phan Wa.

*Ecological notes* : This tree frog is extremely common on buildings and garden vegetation associated with human habitations, and also on roads during and after heavy rains.

*Sympatry* : Found with *Bufo melanostictus*, *Rana limnocharis*, *R. tigrina* and *Kaloula pulchra*.

*Remarks* : It is noteworthy that plain, spotted and longitudinally striped (four stripes) forms (see BERRY 1975) of this species were found on the same building on Phuket. During June and July white foamy spawn masses (see BERRY 1964) were observed on several occasions just above a large tank of water in domestic quarters, and also on the underside of vegetation overhanging a garden pond.

## FAMILY MICROHYLIDAE

### *Kaloula pulchra* Gray

*Locality* : Phuket Province—Laem Phan Wa, Phuket Town.

*Ecological notes* : This species, which is referred to as the Asian Painted Toad, is extremely common in damp areas, ponds, ditches etc. around human habitations; notably after heavy rains when the loud honking noises of the male breeding choruses can be clearly heard (see BERRY 1964).

*Sympatry* : Found with *Bufo melanostictus*, *Rana limnocharis* and *Rhacophorus leucomystax*.

### *Microhyla heymonsi* Vogt

*Locality* : Phangnga Province—Suwan Ku.

*Ecological notes* : This small toad was found in grassy areas approximately thirty metres from a flooded river at the base of a limestone massif.

**Sympatry:** Found with *Bufo asper*, *Ooeidozyga laevis* and *Microhyla inornata*.

*Microhyla inornata* Boulenger

**Locality:** Phangnga Province—Suwan Ku.

**Ecological notes:** as for *M. heymonsi*.

**Sympatry:** Found with *Bufo asper*, *Ooeidozyga laevis* and *Microhyla heymonsi*.

**Remarks:** It is noteworthy that the lineated form, described by TAYLOR (1962) as a subspecies as *Microhyla inornata*, was the form found during the present studies. It should be noted, however, that in some specimens the dorsal longitudinal lines were broken up giving these frogs a spotted rather than a lineated appearance. For a description of the tadpoles see HEYER (1971 b).

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